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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

YAMNITZKY, MARIE ROSE

ART UNIT	PAPER NUMBER
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1774

DATE MAILED: 01/15/2003

14

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/883,734

Applicant(s)

THOMPSON ET AL.

Examiner

Marie R. Yamnitzky

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06/18/01, 12/12/02 & intermediate dates.
- 2a) ☐ This action is **FINAL**.      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-68 and 91-134 is/are pending in the application.
- 4a) Of the above claim(s) 3-14, 95-97 and 117-119 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 100-106 and 109-112 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 15-68, 91, 98, 99, 107, 108, 113, 120, 121, 129 and 130 is/are rejected.
- 7) ☒ Claim(s) 92-94, 114-116 and 122-134 is/are objected to.
- 8) ☒ Claim(s) 1-68 and 91-134 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4-6 & 10-13
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Art Unit: 1774

1. The preliminary amendment filed 02/11/02, which adds claims 91-134, has been entered.

The supplemental preliminary amendment filed 05/23/02, which cancels claims 69-90, has been entered.

Claims 1-68 and 91-134 are pending.

2. This application contains claims directed to the following patentably distinct species of the claimed invention: an emissive layer comprising a phosphorescent organometallic compound and an organic light emitting device comprising an emissive layer comprising a phosphorescent organometallic compound wherein the organometallic compound is (a) an iridium compound, (b) an osmium compound or (c) a platinum compound.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. In addition, applicant is required to select an ultimate species (i.e. a specific organometallic compound) that will be used as the starting point for search and examination purposes. Currently, claims 1, 28, 52, 66-68, 91, 98, 100, 107, 109-113, 120, 122, 129 and 131-134 are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

3. During a telephone conversation with Kevin Godlewski on 05/08/02, a provisional election was made with traverse to prosecute the invention of species (a); claims 1, 2, 15-32, 37-41, 50-52, 66-68, 91-94, 98, 100-103, 107, 109-116, 120, 122-125, 129 and 131-134 read on the elected species.  $\text{Ir(ppy)}_3$  was selected as the ultimate species to be used as the starting point for search and examination purposes. Affirmation of this election must be made by applicant in replying to this Office action. Claims 3-14, 95-97 and 117-119 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. (Note that some of the claims drawn to nonelected species have been considered because there are related generic or linking claims for which there is no relevant prior art.)

Art Unit: 1774

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

5. The disclosure is objected to because of the following informalities:

The U.S. application serial number disclosed at page 8, line 5 does not correspond to the subject matter attributed to the application.

The description of Fig. 7 (p. 16, l. 34-p. 17, l. 4) describes (a), (b) and (c) as part of an "inset" but (a), (b) and (c) are shown separate from Fig. 7 rather than as an inset.

The formula shown for Pt(bph)(bpy) on pages 24 and 31 does not correspond to the chemical name. Based on the chemical name, the lower right ring should be a pyridine ring, with the nitrogen of the pyridine ring bonded to Pt. The chemical name also contains a misspelling; "bipyridianto" should read --bipyridinato--.

Page 23, line 4 through p. 24, l. 5 is the same as p. 30, l. 14-p. 31, l. 12.

Appropriate correction is required.

6. The drawings are objected to the Draftsperson for the reasons noted in the PTO 948 that accompanies this Office action.

In addition, the drawings are objected to by the examiner because each of Figures 35 and 36 contain an error. The x-axis in these two drawings has two occurrences of "300". The second occurrence (between "400" and "600") should apparently read --500-- instead of "300". A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

7. Claims 1, 2, 15-68, 98, 99, 107, 108, 120, 121, 129 and 130 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Various claims are drawn to an emissive layer "of an organic light emitting device". It is not clear if these claims are drawn to the emissive layer, per se, or to an organic light emitting device comprising the layer. If the claims are drawn to the layer per se, limitations imposed by recitation of device structure other than the emissive layer are not clear. For example, it is not clear how claims 26 and 27 further limit the claimed emissive layer since the exciton blocking layer is not a component of the emissive layer.

Various claims recite "for enhancing the quantum efficiency of the organic light emitting device". The limitations imposed by this recitation are not clear. The comparison point is not clear (i.e. it is not clear what device structure/composition serves as the comparison to determine whether quantum efficiency has been enhanced). It is not clear if there are some phosphorescent

Art Unit: 1774

organometallic compounds that would not be capable of enhancing the quantum efficiency of an organic light emitting device and thus are excluded by this claim language.

The use of the term “further” in claim 22 is confusing because 4,4'-bis[N-(1-naphthyl)-N-phenyl-amino]biphenyl is the only explicitly named component of the hole transporting material. It is not clear what this named component is in addition to.

Claims 34-36: These claims are incomplete because R and R' are not defined in claim 34.

The use of the term “further” in claim 44 is confusing because 4,4'-bis[N-(1-naphthyl)-N-phenyl-amino]biphenyl, which is a substituted tri-aryl amine, is the only explicitly named component of the hole transporting material. It is not clear what this named component is in addition to. It is not clear if the hole transporting material must comprise another substituted tri-aryl amine or a polyvinylcarbazole in addition to the named component.

Claims 62, 63 and 65: It is not clear if the complex of claims 62 and 63, and the polarization molecule of claim 65, must be substituted with at least one electron donor and at least one electron acceptor, or if the claim limitations are met by substitution with at least one electron donor or electron acceptor.

Claims 98, 99, 107, 108, 120, 121, 129 and 130: Proper antecedent basis is lacking for “the cycle” as recited in claims 98, 107, 120 and 129. As is evident from the art of record, cyclometallated compounds exist that have more than one cycle. It is not clear if “the cycle” refers to at least one cycle of the compound, or refers to all cycles of the compound.

Art Unit: 1774

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 2 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Maestri et al., "Photochemistry and Luminescence of Cyclometallated Complexes", pp. 1-68 in *Advances in Photochemistry*, Volume 17 (1992).

See pages 1-68 in their entirety. In particular, see pp. 3, 4, 12, 13, 18, 19, 29, 30, 35-39, 61 and 62. The prior art discloses various phosphorescent organometallic iridium complexes such as *fac* tris(2-phenylpyridine)iridium (e.g. see the paragraph bridging pages 35 and 36).

If present claims 1, 2 and 15 are claiming the emissive layer per se, the prior art disclosure of a rigid matrix comprising an iridium complex such as Ir(ppy)<sub>3</sub>, wherein the iridium complex exhibits luminescence in the rigid matrix, is considered to meet the limitations of the emissive layer. Even if claims 1, 2 and 15 are to be interpreted as claiming an organic light emitting device comprising the emissive layer, these claims recite no limitations with respect to the device structure beyond the emissive layer and the prior art anticipates the structure of the emissive layer.

10. Claims 1, 28, 91 and 113 are rejected under 35 U.S.C. 102(b) as being anticipated by Kunugi et al. in *J. Am. Chem. Soc.* Vol. 120, pp. 589-590 (published on Web 01/07/1998).



Kunugi et al. disclose an organic electroluminescent device comprising an anode, a cathode and, between the anode and cathode, an emissive layer comprising an organometallic platinum compound.

Present applicants claim priority under 35 U.S.C. 120 of four prior applications. The earliest disclosure of organometallic platinum compounds is in prior application 09/274,609, filed 03/23/99. Accordingly, the reference to Kunugi et al. is available as prior art under 35 U.S.C. 102(b).

11. Miscellaneous:

In the last line of claims 35 and 42, "polyvinylcarbozoles" should read --polyvinylcarbazoles--.

Claim 49 is lacking a period at the end of the claim.

As a grammatical correction, the examiner suggests deleting "of the" from claim 50.

12. Claims 100-106 and 109-112 are allowed.

Claims 107 and 108 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

13. Claims 92-94 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. Claims 114-116 and 122-134 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 92-94 and 100-112, respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

In the present case, claims 114-116 and 122-134 recite “the phosphorescent organometallic compound emits radiation from a triplet state when a voltage is applied across the emissive layer.” While this language is not explicitly recited in claims 92-94 and 100-112, the limitation is inherent in the requirement for a phosphorescent organometallic compound. Since claims 114-116 and 122-134 are otherwise identical to claims 92-94 and 100-112, respectively, the claims are substantial duplicates.

15. Seven Information Disclosure Statements have been filed in the present application. The cited references have been considered and are made of record with the following exceptions:

The first ten “Other Documents” listed on page 2 of the PTO-1449 received 10/17/01 have not been considered because copies of these documents were not provided as part of the IDS and copies of these documents are not readily accessible to the examiner. Copies of these documents were apparently provided in prior application 09/153,144, but the ‘144 application is unavailable for review by the examiner. Applicants are respectfully requested to provide copies of these ten documents as an attachment to any response to this Office action so that the examiner can consider the references and make them of record.

Art Unit: 1774


Omae's *Organometallic Intramolecular-coordination compounds*, listed on the PTO-1449 received 10/17/01, has not been considered because the only portion of this reference previously provided by applicants is the "Contents" list. If the examiner is expected to consider the entire contents of this book, the book needs to be provided. If only certain sections of the book are considered to be pertinent, applicants need to provide copies of those sections.

With respect to Zollinger's *Color Chemistry*, listed on the PTO-1449 received 10/17/01, a four page "Contents" list was previously submitted that may be from this book, although the source of the list was not indicated. If the entire contents of this book are to be considered by the examiner, the book needs to be provided; if only certain sections are considered to be pertinent, copies of the pertinent sections are required.

16. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (703) 308-4413. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax numbers for Art Unit 1774 are (703) 872-9311 for official after final faxes and (703) 872-9310 or (703) 305-5408 for all other official faxes. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (703) 872-9041.)

MRY  
01/13/03

  
MARIE YAMNITZKY  
PRIMARY EXAMINER

1774